

## Claims

[c1] What is claimed is: 1. A method for managing the routing in a multi-hop network, the method comprising the steps of:

Having a node with a micro-controller means, a RF transceiver means, data storage means, a network interface means with an input buffer, output buffer and auxiliary buffer and a serial device communication means;

Having the data storage means store a plurality of node addresses and configuration data;

Having a plurality of serial devices;

Having the messages contain a header at the beginning of the message with the fields sender node address, transmitter node address, receiver node address and destination node address;

Processing a message to a node from the serial device to network by receiving the message from the serial device, storing the message in the input buffer, copying the message to the output buffer, and transmitting the message to the network;

Processing a message to a node from a serial device to the same serial device by receiving the message from the serial device, storing the message in the input buffer, copying the message is copied to the output buffer and transmitting the message to the serial device;

Processing a message to a node from the network to a serial by receiving the message from the input buffer, storing the message the auxiliary buffer, copying the message to the output buffer, and transmitting the message to the serial device;

Processing a message to a node from the network to the network by receiving the message from the input buffer, storing the message the auxiliary buffer, copying the message to the output buffer, and transmitting the message to the network;

Processing a message by having a sender node send the message, having a plurality of nodes receive and re-transmit the message until the destination node receives the message; and

Processing a message from the network to a node by comparing the node's address with the destination node address; if the address does not match, the

message is a retransmission message and the node searches for the next node and retransmits the message, if the address matches, the message is tested to determine if the message is a network command, if the message is a network command, the network command will be executed by the node, if the message is not a network command, the message is sent to the serial device, if an acknowledgement is required the node sends a request response message to the serial device, after the node receives the acknowledgement from serial device the node sends an acknowledgement to the sender node.

- [c2] 2. The method of claim 1 in which said microcontroller means is an 8-bit micro-controller.
- [c3] 3. The method of claim 1 in which said network interface means consists of an input buffer and an output buffer located internal on the microcontroller means.
- [c4] 4. The method of claim 1 in which said header contains the fields sender node address, transmitter node address, receiver node address, destination node address, length, frame tag, data string and cyclic redundancy check.
- [c5] 5. The method of claim 1 in which said serial device is a computer,  
6. The method of claim 1 in which said serial device is a DVC.
- [c6] 7. The method of claim 1 which includes the steps of:  
setting up an address table automatically by a node send a message to all of the nodes on the network, having the nodes send acknowledge messages to the sender node, having the sender node sort the nodes by the nodes" addresses and loading the addresses into an address table, then the sender sends messages to each node in the network to include the sender node"s address in the other node"s address tables.
- [c7] 8. A communication system comprising: A node with a mircro-controller means, a RF transceiver means, data storage means, a network interface means with an input buffer, output buffer and anxiallary buffer and a serial device communication means;;  
A Data storage means store a plurality of node addresses and configuration data;

A plurality of serial devices;

Messages that contain a header at the beginning of the message with the fields sender node address, transmitter node address, receiver node address and destination node address;

Said node processing a message from the serial device to network by receiving the message from the serial device, storing the message in the input buffer, copying the message to the output buffer, and transmitting the message to the network;

Said node processing a message from a serial device to the same serial by receiving the message from the serial device, storing the message in the input buffer, copying the message to the output buffer, and transmitting the message to the serial device;

Said node processing a message from the network to a the serial device by receiving the message an input buffer, storing the message on an auxiliary buffer, copying the message to the output buffer, and transmitting the message to the serial device;

Said node processing a message from the network to the network by receiving the message an input buffer, storing the message on an auxiliary buffer, copying the message to the output buffer, and transmitting the message to the network;

Said node processing a message by having a sender node sends the message at first., having a plurality of nodes receive and re-transmit the message until the destination node receives the message; and

Said node processing a message from the network in which the destination node address is compared with the node"s address, if the address does not match, the message is a retransmission message and the node searches for the next node and retransmits the message, if the address matches, the message is tested to determine if the message is a network command, if the message is a network command, the network command will be executed by the node, if the message is not a network command, the message is sent to the serial device, if an acknowledgement is required the node sends a request response message to the serial device, after the node receives the acknowledgement from serial device the node sends an acknowledgement to the sender node.

[c8] 9. The device of claim 8 in which said microcontroller means is an 8-bit micro-controller.

[c9] 10. The device of claim 8 in which said network interface means consists of an input buffer and an output buffer located internal on the microcontroller means.

[c10] 11. The device of claim 8 in which said header contains the fields sender node address, transmitter node address, receiver node address, destination node address, length, frame tag, data string and cyclic redundancy check.

[c11] 12. The method of claim 8 in which said serial device is a computer  
13. The method of claim 8 in which said serial device is a DVC.

[c12] 14. The device of claim 8 in which an address table is set up automatically by a node sending a message to all of the nodes on the network, having the nodes send acknowledge messages to the sender node, having the sender node sort the nodes by the nodes' addresses and load into an address table, then the sender sends messages to each node in the network to include the sender node's address in the other nodes' address tables.